

## 多药马兜铃亚属的分类修订

马金双

(北京师范大学生物系, 北京 100875)

### A TAXONOMIC REVISION ON GENUS *ARISTOLOCHIA* SUBGENUS *PARARISTOLOCHIA*

MA JIN-SHUANG

(Beijing Normal University, Beijing 100875)

**Summary** *Aristolochia* Subgen. *Pararistolochia* (Hutch. & Dalz.) O. C. Schmidt, a smallest one among so far known three subgenera in the genus, often treated as a separate genus, is composed of only nine species from Tropical Africa (8 species) and Tropical Asia (1 species). This work deals mainly with the system and taxonomic treatment as well as distribution based on the herbarium materials from British Museum (Natural History) (BM), National Botanical Garden of Belgium (BR), Royal Botanic Gardens of Kew (K) and Laboratoire de Phanerogamie of Paris (P). Three sections in the subgenus are described as new by the number of anthers and its arrangement. Also two names, *Pararistolochia zenkeri* (Engl.) Hutch. & Dalz. and *P. macrocarpa* (Duch.) Poncy var. *soyauxiana* (Oliv.) Poncy, are reduced to synonyms of *A. macrocarpa* Duch.; and one name, *A. preussii* Engl., is reduced to a synonym of *A. promissa* Mast.

**Key words** Subgenus *Pararistolochia*; *Aristolochia*; Taxonomic revision; System; Africa; Asia

**摘要** 多药马兜铃亚属是马兜铃属目前已知 3 个亚属中最小的一个亚属, 约 9 种, 其中 8 种产于热带非洲, 1 种产于热带亚洲(马来西亚)。本工作从经典分类学角度对该亚属的系统进行了探讨, 首次利用花药数目及其排列方式将其划分为三个组, 并对其中所含的种类进行了分类学处理, 本文承认 9 种及 3 个新异名。

**关键词** 多药马兜铃亚属; 马兜铃属; 分类修订; 系统; 非洲; 亚洲

### BRIEF HISTORY OF TAXONOMY

Bentham & Hooker (1883) first placed four species with 9 — 24 anthers into

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the genus *Aristolochia* as Sect. *Polyanthera*, compared with other sections often with six, rarely five, anthers; this treatment was followed by Weisse (1927). Hutchinson & Dalziel (1927, 1928) retreated this group, which has cucumber-shaped indehiscent woody fruits and the gynostemium with 6—24 anthers, as an independent genus, *Pararistolochia*, composed of 12 species only from Africa. It was followed by Huber (1960, no species number recorded) and Poncy (1978, 9 species and 1 variety recognized only). O. C. Schmidt (1935), however, considered it as a subgenus of the genus *Aristolochia* for having the same structure with the latter, a mirable gynostemium, combined body of the female and the male parts in a flower. And this treatment is confirmed by very recent revision on the genus *Aristolochia* from East and South Asia, a differentiated center in distribution (Ma 1989).

In addition, there is another view that regards this group as a member of the genus *Aristolochia* without subdivision (Baker & Wright 1913; Gregory 1956; Hou 1983, 1984, Jongkind 1990). Therefore, the system of the subgenus is still open to further study. That is the main goal of this revision.

## MORPHOLOGICAL CHARACTERS

The subgenus *Pararistolochia* is characterized by the following characters different from the other subgenera: 1. anthers (6)8—10 (24) (the others often with 6, rarely 5); 2. (6)8—10(12) lobes at the top of gynostemium (the others often with 6 lobes, rarely 5 or 3 lobes); 3. woody indehiscent fruits (the others with capsules). The special characters of the subgenus is summarized here:

Stem: woody climber; the cross section is in “ $\infty$ ” form, which could be rarely found in the other subgenera of the genus (Ma 1989).

Perianth: curved in “V” form or obscurely incurved into ball-shaped at the base of perianth, with one or three lobes at the top of perianth, sometimes two kinds lobes appeared together in *A. promissa* Mast.; the largest perianth may be as long as 30 cm in *A. goldiana* Hook. f. and the smallest perianth only 7cm long in the most species. Some species with an appendant tail at the top of perianth and it may be as long as the perianth itself (including lobe), the character which has never been found in the other subgenera.

Anther: considerable variation is found in the number of the anthers from 6 (by 2 species) to 8—10 (by most species) to 24 (by only one species), and its relation to lobes of the gynostemium in arrangement (single or double anthers opposite one lobe of gynostemium) is an important taxonomic character for the subdivision of the subgenus (Ma 1989). It is by this character that the three sections in the subgenus are described as new (see below).

As well known, the taxon is very rare; specimens even at the large herbaria in Europe are still very limited, and especially those with flowers and fruits are badly needed as many taxonomists pointed out (Poncy 1978; Hou 1983, 1984; Ma 1989, 1990; Jongkind 1990).

## TAXONOMIC TREATMENT

Subgenus **Pararistolochia** (Hutch. & Dalz.) O. C. Schmidt in Engl. & Prantl, Nat. Pflanzenfam. ed 2, 16B: 237, 1935; J. S. Ma in Acta Phytotax. Sin. 27(5): 321, 1989. — *Pararistolochia* Hutch. & Dalz., Fl. W. Trop. Afr. 1: 75, 1927 & in Kew Bull. 1928: 22, 1928; Poncy in Adansonia 17: 465, 1978.

Three sections and nine species in total are recognized in this paper, eight from tropical Africa (especially C. & W. Africa) and one from tropical Asia (Malesia).

Lectotypus nominis subgeneris: *Aristolochia macrocarpa* Duch. (*Pararistolochia macrocarpa* (Duch.) Poncy, fide Poncy 1978).

### Key to the sections and the species

1. Anthers 24, arranged in 12 pairs with 12 lobes of gymnostemium; perianth 20 — 30cm long; leaves cordate ..... Sect. 1. **Pararistolochioides** J. S. Ma; 1. *A. goldiana* Hook. f.
1. Anthers (6)8 — 10, arranged with (6)8 — 10 lobes of the gymnostemium,
  2. Anthers 8 — 10 ..... Sect. 2. **Pararistolochia**
    3. Leaves 5 lobed; perianth c. 6 cm long with 3 short lobes at the top ..... 2. *A. mannii* Hook. f.
    3. Leaves entire,
      4. lobes of perianth with an appendant tail,
        5. Tail slender and long, longer than perianth; leaves elliptic ..... 3. *A. promissa* Mast.
        5. Tail small and short, shorter than perianth; leaves cordate ..... 4. *A. decandra* Hou
      4. Lobes of perianth without an appendant tail,
        6. Perianth with asymmetrical lobes; anthers only 9 ..... 5. *A. incisiloba* Jongkind
        6. Perianth with symmetrical lobes; anthers 8 — 10,
          7. Leaves broad-ovate, constricted at middle; lobes of perianth no more than 2cm long, 3 — 4 mm wide; fruit 10 — 20 cm long ..... 6. *A. triactina* Hook. f.
          7. Leaves elliptic, entire; lobes of perianth 3 — 5 cm long, more than 5mm

- 5 mm wide; fruit 30 — 50 cm long ..... 7. *A. macrocarpa* Duch.
2. Anthers only 6 ..... Sect. 3. *Aristolochioides* J. S. Ma
8. Perianth with only one lobe at the top; leaves elliptic ..... 8. *A. leonensis* Mast.
8. Perianth with 3 short lobes at the top; leaves ovate ..... 9. *A. ceropegioides* S. Moore

Sect. 1. *Pararistolochioides* J. S. Ma, sect. nov.

Antherae 24, in 12-jugi cum 12 lobes gymnostemii dispositae.

Typus nominis sectionis: *A. goldiana* Hook. f.

1. *Aristolochia goldiana* Hook. f. in Trans. Linn. Soc. Bot. 25: 185, t. 14, 1865; Baker & Wright in Thiselton-Dyer, Fl. Trop. Afr. 6(1): 142, 1913. — *Pararistolochia goldiana* (Hook. f.) Hutch. & Dalz., Fl. W. Trop. Afr. 1: 75, 1927 & in Kew Bull. 1928: 25, 1928 & in Keay, Fl. W. Trop. Afr. ed 2, 1: 79, 1954; Poncy in Adansonia 17: 484, 1978. (Pl. 1:3 — 4. )

Distrib.: Cameroon, Nigeria and Sierra Leone.

Materials studied: **Cameroon**, Mildbread 8812(K), Zenker 4625(BM, K, P). **Nigeria**, Kennedy 1384(K), Olorunfemi 54965(K), Talbot 2338, 2339, 2340, 2341(BM). **Sierra Leone**, Morton & Gledhill SL 1809(K).

Sect. 2. *Pararistolochia*

Antherae 8 — 10, simplices cum 8 — 10 lobes gymnostemii dispositae.

Typus nominis sectionis: *A. macrocarpa* Duch.

2. *Aristolochia mannii* Hook. f. in Trans. Linn. Soc. Bot. 25: 186, 1865; Baker & Wright in Thiselton-Dyer, Fl. Trop. Afr. 6(1): 140, 1913. — *Pararistolochia mannii* (Hook. f.) Keay in Kew Bull. 1952: 129, 1952; Hutch. & Dalz. in Keay, Fl. W. Trop. Afr. ed. 2, 1: 79, 1954; Poncy in Adansonia 17: 478, 1978. — *A. ju-ju* S. Moore in Journ. Bot. 58: 269, 1920. — *P. ju-ju* (S. Moore) Hutch. & Dalz., Fl. W. Trop. Afr. 1: 75, 1927 et in Kew Bull. 1928: 23, 1928. (Pl. 2:1 — 2. )

Distrib.: Benin, Congo, Ivory Coast and Nigeria.

Materials studied: **Benin**, Testu 152(BM, P). **Congo**, Lecomte C 103(P). **Ivory Coast**, IEMVT 1252 (P), Wit 774 (K), 8015 (BM). **Nigeria**, Mann 2323(Type, P), Talbot 3766(Type of *A. ju-ju*, BM), Kalhreyer 62(BM).

3. *Aristolochia promissa* Mast., Gard. Chron. 11: 494, 1879; Baker & Wright in Thiselton-Dyer, Fl. Trop. Afr. 6(1): 142, 1913. — *Pararistolochia promissa* (Mast.) Keay in Kew Bull. 1952: 160, 1952; Hutch. & Dalz. in Keay, Fl. W. Trop. Afr. ed. 2, 1: 79, 1954; Poncy in Adansonia 17: 491, 1978. — *A. flagellata* Stapf in Kew Bull. 1906: 80, 1906. — *A. talbotii* S. Moore,

Cab. Talb. Nig. Pl. 1: 93, 1913. — *A. tenuicauda* S. Moore l. c. 1: 94, 1913. — *P. talbotii* (S. Moore) Keay in Kew Bull. 1952: 161, 1952. — *P. tenuicauda* (S. Moore) Keay, l. c. 1952: 160, 1952. — *A. preussii* Engl., Bot. Jahrb. 24: 492, 1898. — *P. preussii* (Engl.) Hutch. & Dalz., Fl. W. Trop. Afr. 1: 75, 1927 & in Kew Bull. 1928: 24, 1928; Poncy in Adansonia 17: 484, 1978. (Pl. 2: 3 — 4.)

There is little difference between *A. preussii* and *A. promissa*. As Hutchinson noted, the former has a small broad tail and the latter a small string one on each lobe of perianth. Poncy (1978) has doubted about this. After comparing these specimens from different habitats, the author believes that they should be included in a species.

Distrib. : Widely in West Tropical Africa.

Materials studied (only part of specimens studied is listed here): **Cameroon**, Bates 1775(K). **Centrafrica**, Sillans 1671(BM). **Gabon**, Tetsu 7489(BM, BR). **Congo**, Germain 105(BR). **Ivory Coast**, Levinue 1806(K). **Nigeria**, Jones & Onochie 2318 (Type of *A. tenuicauda*, BM), 2310 (Type of *A. talbotii*, BM). **Zaire**, Babault 207 (BR).

4. *Aristolochia decandra* D. Hou in Blumea 28: 343, 1983 & in Steenis, Fl. Males. 10(1): 100, 1984. (Pl. 3: 1)

Distrib. : Malesia, Western Borneo (Kalimantan), the only species of the subgenus in tropical Asia.

No materials studied in this work. For the further information see Dr. D. Hou (1983, 1984), from that I am sure that it is a good species.

5. *Aristolochia incisiloba* Jongkind in Bull. Jard. Bot. Belg. 60: 147 — 150, fig. 1, 1990.

Distrib. : Gabon, Chaillu Mts., Songou Mt., Louis, Breteler & Bruijn 975(holotypus, WAG, not seen).

"..... mouth with two glabrous lobes, the lower one up to 4.5 cm long and 3.5 cm wide, the upper one up to 3.5 cm long and 4 cm wide with an incision at the apex c. 13 mm long, ..., anthers 9, pale brown; style column with 9 lobes ;". From this and Jongkind's figure I am sure that this is a very interesting species.

6. *Aristolochia triactina* Hook. f. in Trans. Linn. Soc. Bot. 25: 186, 1865; Baker & Wright in Thiselton-Dyer, Fl. Trop. Afr. 6(1): 40, 1913. — *A. schweinfurthii* Engl., Bot. Jahrb. 24: 492, 1898. — *Pararistolochia triactina* (Hook. f.) Hutch. & Dalz., Fl. W. Trop. Afr. 1: 75, 1927 & in Kew Bull. 1928: 24, 1928 & in Keay, Fl. W. Trop. Afr. ed 2, 1: 79, 1954; Poncy in Adansonia 17: 479, 1978. — *P. schweinfurthii* (Engl.) Hutch. & Dalz., l. c. 1: 75, 1927 & l. c. 1928: 24, 1928. (Pl. 3: 2.)

Distrib. : Widely spread from Cameroon to Angola.

Materials studied(only part of specimens studied is listed): **Cameroon**, Bos 3505(BR, K), Thomas 270(K). **Angola**, Gossweiler 4884(K). **Centrafrica**, Testu 2609(BM). **Congo**, Dybowski 114 (P). **Gabon**, Halle 706 (P). **Sudan**, Schweinfurth 3507(K). **Tchad**, Chevalier 7062(BR). **Zaire**, Bamps 546(BR).

7. *Aristolochia macrocarpa* Duch. in DC Prodr. 15(2): 497, 1864. — *A. zenkeri* Engl., Bot. Jahrb. 24: 490, 1898. — *A. staudtii* Engl., l. c. 24: 491, 1898. — *A. flos-avis* A. Chev. in Journ. Bot. 12: 129, 1909. — *A. tessmannii* Engl. l. c. 46: 419, 1911. — *A. tribrachiata* S. Moore, Cat. Bot. Nig. Pl. 1: 92, 1913. — *Pararistolochia staudtii* (Engl.) Hutch. & Dalz., Fl. W. Trop. Afr. 1: 75, 1927 & in Kew Bull. 1928: 24, 1928. — *P. flos-avis* (A. Chev.) Hutch. & Dalz., l. c. 1: 75, 1927 & l. c. 1928: 24, 1928. — *P. tribrachiata* (S. Moore) Hutch. & Dalz., l. c. 1: 75, 1927 & l. c. 1928: 24, 1928. — *P. macrocarpa* (Duch.) Poncy in Adansonia 17: 488, 1978. — *P. macrocarpa* (Duch.) Poncy var. *soyauxiana* (Oliv.) Poncy l. c. 17: 490, 1978, syn. nov. — *A. soyauxiana* Oliv. in Hook., Icon. Pl. 1410, 1883. — *P. soyauxiana* (Oliv.) Hutch. & Dalz., l. c. 1: 75, 1927 & l. c. 1928: 23, 1928. — *P. zenkeri* (Engl.) Hutch. & Dalz., l. c. 1: 75, 1927 & l. c. 1928: 24, 1928 & in Keay, Fl. W. Trop. Afr. ed 2, 1: 80, 1954; Poncy in Adansonia 17: 486, 1978, syn. nov. (Pl. 3: 3 — 4.)

The present author examined the specimens identified by Poncy(1978) and those recently collected but not identified by her, and considers that the difference between *A. macrocarpa* and *A. zenkeri* is not beyond one good species.

Distrib. : Widely spread in western Africa.

Materials studied (part of specimens studied is listed): **Cameroon**, Annet 414 (P), Zenker 1226 (Type of *A. zenkeri*, P). **Congo**, Sita 2880 (P). **Centrafrica**, Fidao s. n. (P). **Gabon**, Lecomte 21145 (Type of *A. flos-avis*, P). **Ghana**, Ross 40 (BR). **Ivory Coast**, Cremers 284 (BR). **Nigeria**, Brean 8467 (K). **Zaire**, Teussaint 329 (BR).

Sect. 3. *Aristolochioides* J. S. Ma, sect. nov.

Antherae 6, simplices cum 6 lobes gymnostemii dispositiae.

Typus nominis sectionis: *A. leonensis* Mast.

8. *Aristolochia leonensis* Mast. in Journ. Linn. Soc. Bot. 30: 95, 1894. — *Pararistolochia leonensis* (Mast.) Hutch. & Dalz., Fl. W. Trop. Afr. 1: 75, 1927 & in Kew Bull. 1928: 24, 1928 & in Keay, Fl. W. Trop. Afr. ed. 2, 1: 79, 1954; Poncy in Adansonia 17: 480, 1978.

Distrib. : Sierra Leone, Liberia, Nigeria and Ivory Coast.

Materials studied: **Sierra Leone**, Elliot 5041(BM), 5062(Type, K). **Liberia**,

Adam 21123(K), Harley 1300(K). **Nigeria**, Pitz 1971(K). **Ivory Coast**, Assi 9979(K).

9. **Aristolochia ceropegoides** S. Moore in Journ. Bot. **58**: 269, 1920.  
— *Pararistolochia ceropegoides* (S. Moore) Hutch. & Dalz., Fl. W. Trop. Afr. **1**: 75, 1927 & in Kew Bull. **1928**: 24, 1928; Poncy in *Adansonia* **17**: 482, 1978. (Pl. 1: 1 — 2.)

Distrib.: Cameroon and Gabon.

Materials studied: **Cameroon**, Bates 1235 (Type, BM), 1446 (BM), Mezili 187 (P). **Gabon**, Halle & Thomas 389 (P), Halle 3230 (P), Hladik 2078 (P).

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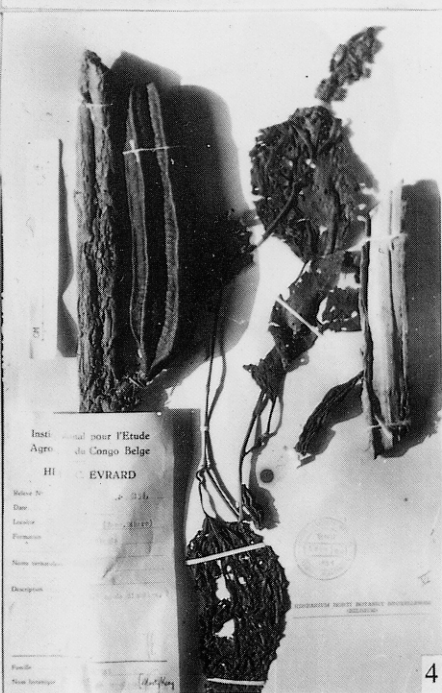
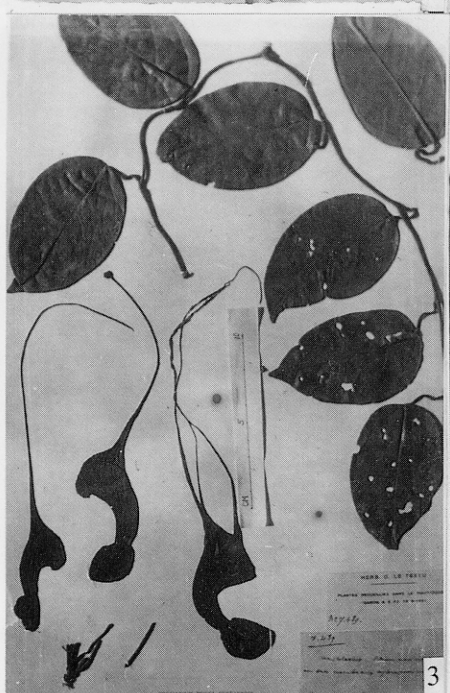
### 图版说明 Explanations of plates

**Plate 1**, 1 — 2. *Aristolochia ceropegoides* S. Moore; 3 — 4. *Aristolochia goldieana* Hook. f.

**Plate 2** 1 — 2. *Aristolochia mannii* Hook. f.; 3 — 4. *Aristolochia promissa* Mast..

**Plate 3** 1. *Aristolochia decandra* D. Hou (from D. Hou 1983); 2. *Aristolochia triactina* Hook. f.; 3 — 4. *Aristolochia macrocarpa* Duch.





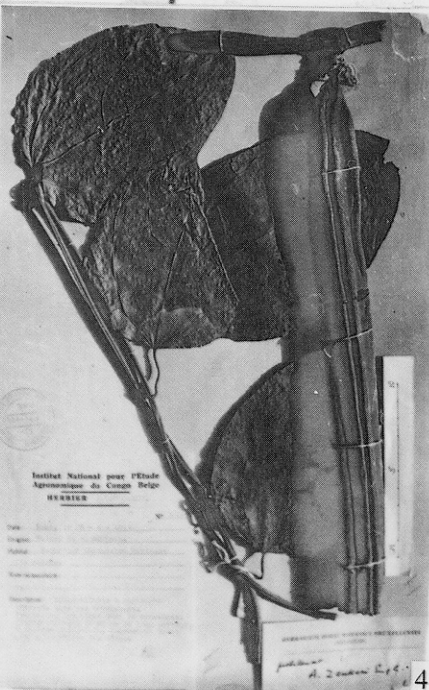
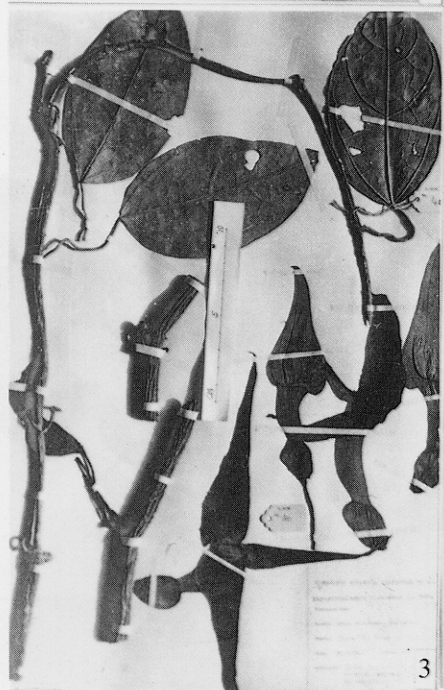
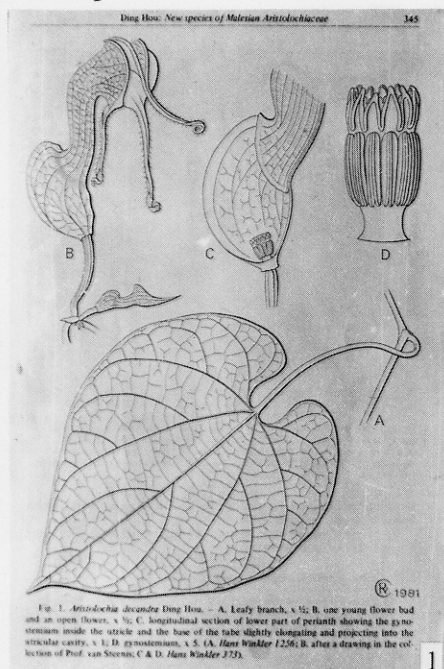
see explanation at the end of text

马金双:

Ma Jin-shuang:

图版 3

Plate 3



see explanation at the end of text